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The challenges of certifying tropical community forests: A case study from Honduras

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1 **THE CHALLENGES OF CERTIFYING TROPICAL COMMUNITY FORESTS: A**
2 **CASE STUDY FROM HONDURAS**

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29 **THE CHALLENGES OF CERTIFYING TROPICAL COMMUNITY FORESTS: A**
30 **CASE STUDY FROM HONDURAS**

31
32 *Abstract*

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34 This article examines the challenges involved in certifying tropical community forestry
35 operations, by drawing on a case study of FSC certified community forest management in
36 Honduras. We identify social, economic, and environmental factors that require increased
37 attention to improve certification as an instrument for sustainable community forest
38 management, and discuss the linkages between these factors. The complexity of resource
39 rights, the heterogeneity of forest users, and the difficulty of small Southern producers in
40 competing in certified forest markets would need specific attention concerning certified
41 community forestry operations. Concerning environmental sustainability, the focus in
42 fragmented community forests under low-intensive logging should be directed towards
43 landscape connectivity and forest restoration instead of reducing mechanical logging damage.
44 Finally, without changes to the position of small Southern producers in the global trade
45 networks, the ability of certifications to create sustainable livelihoods is limited.

46
47 **Keywords:** community forestry, environmental governance, forest certification, Forest
48 Stewardship Council, Honduras, social and environmental sustainability

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Biographical Sketch

Mari Bieri is a PhD student at the Department of Environmental Sciences at the University of Helsinki. Her research focuses on the ecological impacts of forest certification in tropical community-based forest operations.

Anja Nygren is a Senior Lecturer at the Institute of Development Studies and an Adjunct Professor of Environmental Policy at the University of Helsinki. She has long-term research experience in Costa Rica, Nicaragua and Honduras. Nygren's areas of interest include forest certifications, fair trade, environmental governance, decentralization, local livelihoods, and environmental movements.

THE CHALLENGES OF CERTIFYING TROPICAL COMMUNITY FORESTS: A CASE STUDY FROM HONDURAS

Introduction

Forest certifications emerged in the early 1990s as new, market-based mechanisms of environmental governance to tackle tropical deforestation. Third-party certifications have been considered as promising alternatives of environmental governance in a situation where conventional forms of governmental regulation have been criticized as inadequate and too slow (Cashore, Gale, Meidinger & Newsom, 2006). Another impetus for the proliferation of forest certifications has been the growing environmental awareness and public advocacy of sustainable forestry (Taylor, 2005a; Tollefson, Gale & Haley, 2008).

The first certification scheme, the Forest Stewardship Council (FSC), was created in 1993 by international environmental NGOs, together with human rights groups and industry representatives. By the end of the decade, a range of different certification schemes, such as the Pan-European Forest Certification (PEFC) and Sustainable Forestry Initiative (SFI), had been established (Klooster, 2005; Pattberg, 2005). By mid-2010, about 355 million hectares of the world's forestland, representing 9% of the global forest estate, had been certified. About 56% of these forests were situated in North America, 24% were in Western Europe, while 8% were in Latin America, Asia, and Africa (ITTO, 2010; UNECE/FAO, 2010). These figures indicate that most of the growth in certification has occurred in the boreal and temperate forests rather than in the tropical forests whose sustainable use the certifications were initially intended to support.

In parallel with this trend, most of the certificates have been awarded to industrial operators, while only 1% of community forests worldwide have been certified (Molnar et al.,

2004). This is despite the fact that 22% of the forest estate in the 18 most forested developing countries is currently owned or managed by local communities, and this share is estimated to rise in the future as a result of decentralization and the devolution of forest resources to local communities (White & Martin, 2002, p. 5). In much of the discussion on certification, the focus has been on Northern countries with significant records of industrial wood production, while less attention has been paid to certified community forestry operators in the South. However, sustainable forestry is much more challenging in many tropical developing countries, which are characterized by weak forest governance, unsupportive socio-economic structures, diverse forest ecosystems, and multifaceted interests towards forest resources (Ebeling & Yasué, 2009).

In this article, we examine the challenges of FSC certification in supporting sustainable forest management in tropical forest ecosystems and communities, by drawing on a case study of certified community forestry in Río Cangrejal, Honduras. FSC has the most rigorous standards among the existing forest certifications, and it is the most prevalent certification scheme in the Southern hemisphere (Klooster, 2006; Pattberg, 2005). To promote environmentally responsible, socially beneficial and economically viable forest management, FSC has elaborated a set of ten principles and their criteria as a framework for evaluating the sustainability of forest management (FSC, 2002). Although some national and area-specific indicators are currently under elaboration in many countries, these principles act as important generic guidelines for FSC certified forest management.

The first section of this article describes the study area and the methods used in this research. The second section analyzes each FSC principle in relation to the certified community forest operations in Río Cangrejal, by identifying the main socio-economic and environmental factors that affect the potential of the FSC principles to promote sustainable community forestry in the tropics. The third section discusses the interlinkages between the

environmental and socio-economic aspects of certified forest management, while the final section presents conclusions and policy implications concerning tropical certifications and local livelihoods.

Context and Methods

The study area is located in Río Cangrejal, northern Honduras, 10–30 km south of the city of La Ceiba. The territory of Río Cangrejal covers 123 000 ha of land and the population is about 6 300 inhabitants scattered in seven communities. The forest resources in Río Cangrejal are state-owned; however, local community forestry groups manage them under a customary rights agreement. Because of the selective logging of commercially valuable timber species such as *Swietenia macrophylla* and *Cedrela odorata* during the 1970s and 1980s, the populations of these species have declined. Currently, a range of twenty non-traditional timber species are logged for commercial purposes. Illegal logging is a serious problem in Río Cangrejal, as elsewhere in the country; up to 75–85% of the hardwood extracted from broadleaved forests in Honduras is estimated to be illegally logged (Richards, Wells, del Gatto, Contreras-Hermosilla & Pommier, 2003).

Our study focused on three certified community forestry groups and three non-certified community forestry operations in Río Cangrejal (Table 1). The certified forestry groups received their first certificate of good forest management in 1991 through the Rainforest Alliance's Smartwood Program, later accredited by the FSC (Markopoulos, 2003). The groups have since then been re-certified various times under the umbrella organization, Cooperative Agroforestal Regional (COATLAHL). As one of the oldest community forestry initiatives certified anywhere in the world, these groups represent an interesting case in analyzing the challenges included in the certification of tropical community forest operations.

The socio-economic data related to community forest management in Río Cangrejal were gathered in 2004. In total, 58 thematic interviews were conducted with local households, including members in the certified and non-certified community forestry groups, to gather data on the logging operations, forestry incomes and costs, social organization, and the embedded social rules and cultural practices. These interview data were crosschecked by participant observation. Visits to logging sites, sawmills, and furniture factories offered important insights into prevailing working conditions and ways of doing business, while participation in meetings and social gatherings provided information on the social networks and political power relations involved. In illegal logging, participant observation was the only method to obtain reliable in-depth data.

In addition, 30 interviews were conducted in different ministries, municipal offices, development projects, certification firms, and NGOs to examine the institutional context that shapes the community forest activities. These empirical data were supplemented by statistical data, governmental documents, and development reports that were subjected to content analysis. The main aim of the socio-economic analysis was to evaluate the economic feasibility of certified forestry and to understand the socio-political processes that shape the sustainability of the certified community forestry operations in the region.

The ecological data related to certified forest management were collected in 2005. The ecological impact of certification was studied by comparing the certified forests to conventionally managed forests, as well as to natural forests of the Pico Bonito National Park that borders the area (Table 1). The main focus in the assessment of the ecological impact was on the regeneration success of the economically valuable timber tree species and the species composition within the logging gaps. Environmental characteristics of the logging gaps and natural treefall gaps were also compared to evaluate the logging damage that had occurred.

FSC Principles in Relation to Tropical Forests and Forest Communities

COMPLIANCE WITH LAWS AND FSC PRINCIPLES

FSC Principle #1 aims to ensure that forest management complies with the applicable national laws and international treaties (Table 2). In many developing countries, the forest laws are, however, unstable and not easily adaptable to the conditions of community forestry (Ribot & Peluso, 2003). According to Honduran legislation, forest management contracts for community forestry groups on state-owned lands are granted for a period of four years at time (Decreto 31-92, 1992). A four-year contract is, however, too short for the planning of forest management. Due to bureaucratic procedures, the renewal of the contract can take 1–2 years, during which time the groups have to reduce their activities. Volatile forest policies make the institutional position of certified community forestry insecure.

Nevertheless, according to our interview data and the studied ministerial documents, the Honduran community forestry groups with an FSC certificate have received their forest management contracts quicker than the non-certified ones. Certified community forestry operations have also been facilitated in governmental audits, since the FSC certificate has qualified as proof of the groups' good forest management practices. The FSC initiative of Small and Low-Intensity Managed Forests (SLIMF), which aims to streamline the procedures for forest management for small forest operations, has played a crucial role in the promotion of this relief.

According to Honduran legislation, the community forestry groups can only harvest 200 m³ of timber per year (Decreto 31-92, 1992). This legally defined harvesting rate has weak silvicultural justifications, as in many cases it is considerably below the forest's

productive potential. In the community of Toncontín, for example, the annual allowable cut according to the forest's silvicultural potential was estimated to be 1829 m³ (AFE-COHDEFOR, 2000). The low logging quotas constrain the community forestry groups' opportunities to earn a feasible income from forestry. This is an issue that the development experts urging the community forestry groups to apply for certification have not taken sufficiently into account.

FSC Principle #1 also demands that the certified forests are protected from illegal harvesting, settlement and other unauthorized activities. However, there is no specification in the FSC criteria of whose responsibility it is to protect the forests against unauthorized use. During the structural adjustment policies implemented in Honduras, as in many other developing countries in recent years, the role of governmental institutions in the forest regulation has been reduced. At the same time, non-state mechanisms, including certifications, have been promoted as efficient alternatives of forest governance. However, several questions remain concerning the ability of these non-state mechanisms to fulfil the regulatory tasks of the weakened state institutions (Howlett et al. 2009; Taylor, 2005b).

In Honduras, the acceleration of forest certification has led to considerable responsibility for the prevention of illegal logging being placed on local forest managers. In our interviews and discussions, forest authorities repeatedly stated that it is the task of the certified forestry groups to protect the forests under their management against illegal logging. Correspondingly, the Río Cangrejal forestry groups explained to us that they have been obliged to establish a system of voluntary guards of forest vigilance. This task is dangerous, as most of the illegal timber dealers are armed and in the worst cases linked to drug dealing (Richards et al., 2003). The transfer of law enforcement tasks from state institutions to local voluntary groups can have questionable consequences for human rights. Although certifications can have an important role in supporting public regulation, they can hardly

replace the governmental responsibilities of forest regulation and law enforcement
(Tahkokallio & Nygren, 2008).

TENURE AND USE RIGHTS AND RESPONSIBILITIES

FSC has demonstrated a strong commitment to community forest certifications. This effort is evident in FSC Principle #2, which emphasizes the necessity for the legal establishment of local resource rights. In Río Cangrejal, FSC certification has improved people's awareness of their resource rights and helped the community forestry groups to receive better governmental recognition of their customary rights. This especially concerns the efforts of local forestry groups to defend their resource rights in relation to large-scale cattle raisers and land speculators (Field data, 2004–2005; SmartWood, 2003).

On the other hand, the FSC requirement that the local communities' long-term use rights need to be clearly documented and legally established does not fully recognize the existing legal pluralism in many developing countries. Because of the lack of formal documentation, customary rights can be difficult to legitimate along with formal standards of legality. The move from a focus on legally established resource rights towards a broader access approach that recognizes the role of both *de jure* and *de facto* rights in shaping the access to productive resources (Ribot & Peluso, 2003) could provide a more appropriate approach to the conditions under which many Southern community forestry groups, including those of Río Cangrejal, operate.

INDIGENOUS PEOPLES' RIGHTS

FSC Principle #3 aims to protect the legal and customary rights of indigenous peoples. This

principle does not apply in Río Cangrejal, as most of the local inhabitants are mestizo-ladinos.

COMMUNITY RELATIONS AND WORKER'S RIGHTS

FSC Principle #4 aims to ensure that forest management maintains or enhances the long-term social and economic well-being of local communities and forest workers. In the evaluations in Río Cangrejal, FSC-accredited certifiers have applied this principle by requiring that the certified forestry groups establish mechanisms for efficient integration of the wider community into the decision-making on forest management and the distribution of forestry income (SmartWood, 1996, 1998, 2003).

The inclusion of a wide range of community members as direct beneficiaries of forest operations is, however, a complicated task. First, this requirement fails to acknowledge that in management contracts, the legal responsibility for forest management is assigned to the forestry groups, who thus bear the risks and costs involved. As cutting quotas are restricted, it may be difficult to channel the economic benefits from timber production to a wide range of community members. Second, the requirement that forest operations should cater for the needs of all community members relies on a conventional view of forest communities as socially cohesive units, where the resources are collectively managed and the benefits are equitably shared. Such a view underestimates the heterogeneity of actors prevalent in Southern communities, and the power relations through which access to forest resources is mediated (Cleaver, 2002; Nygren, 2005). Our analysis of the socio-economic profile of Río Cangrejal revealed marked variation between local households in the degree to which they incorporated forestry into their livelihoods (Nygren & Myatt-Hirvonen, 2009). As timber harvesting is physically demanding, persons engaged with forestry were usually young

males. Women did not have direct control over the forestry income, although they had an important role in the gathering of non-timber forest products, such as orchids, as well as in managing the household budget. Some powerful economic and political operators were eager to take advantage of the opportunities provided by forest certification, with certain risks of the ‘elite capture’.

This does not mean that the communities of Río Cangrejal had not benefitted from certified forestry. The forestry groups employed many villagers in timber hauling and a great number of local inhabitants had participated in the training courses organized by development projects, supporting certified forestry in the region. Through multiplier effects on local income and employment, certified forestry can have an important role in the mitigation of rural poverty. Such indirect benefits also include social learning, whereby local communities can gain expertise in environmentally and socially responsible forest management.

Certification as a mechanism of social learning can, however, also be questioned. This especially concerns the cases where certification has largely been organized by foreign donors. In our interviews and discussions with the forestry group members in Río Cangrejal, most of them demonstrated limited understanding of the principles of FSC. This situation raises questions concerning the ability of FSC to provide a feasible channel for Southern producers to promote alternative values of environmental sustainability and social justice to challenge the existing inequalities in global wood production and trade (Taylor, 2005b).

Concerning worker’s rights, FSC Principle #4 requires that national laws and international conventions related to occupational health and safety are met, although these requirements are applied less rigorously in community forest management. According to our participant-observation data, the conditions of employment were better in the certified community forest operations in Río Cangrejal, although not significantly different from the informal working conditions in Honduras, where social security benefits, such as vacations,

pensions, or paid sick leaves, are widely absent. The certified forestry groups aimed to pay the Honduran minimal salary for hired workers, such as timber haulers and mule transporters, and to distribute the forestry incomes within the forestry groups in an accountable and fair way. However, as the profits gained from forestry were limited, the groups could not afford the costs related to workers' health coverage and accident insurance (Field data, 2004–2005; SmartWood, 2003, pp. 26–28).

Part of the timber produced by the Río Cangrejal forestry groups is processed in the workshop of the cooperative COATLAHL and sold as certified furniture and kitchenware to European furnishing retailers. In these operations, the standards of the Honduran labour laws are followed. Another part of the timber is sold to conventional sawmills and furniture factories, many of which operate in Honduran free trade zones. The Honduran government's opportunities to control the working conditions in these free trade zones are limited, and the FSC requirements of workers' rights do not apply to these operators, either. Interestingly, the FSC principles of workers' rights largely rely on the same conventions of the International Labour Organization (ILO) that Honduras has ratified in its labour laws. The limited rights of poor workers do not thus stem from a lack of appropriate legislation; rather, the problem lies in the weak implementation of existing laws. FSC as a voluntary mechanism has limited opportunities to require the effective enforcement of labour laws.

BENEFITS FROM THE FOREST

Socio-economic viability

FSC Principle #5 aims to ensure that forest management is economically viable and provides a wide range of environmental and social benefits. Concerning socio-economic viability, one

of the motives in the creation of FSC certification was the idea that it would help forest managers to gain a price premium and access to value-added markets. Despite high expectations, the price premiums for certified timber producers have at best been modest (Klooster, 2006; Pattberg 2005). Unlike certifications by the Fair Trade Labelling Organizations International (FLO) for agricultural products such as coffee, cocoa and bananas, where minimum prices are guaranteed for Southern producers, in forest certifications the prices are largely left up to the workings of the market (Raynolds, Murray & Wilkinson, 2007; Taylor, 2005a; Valkila & Nygren, 2010). Many forest markets do not, however, demand certified products, nor are the end consumers willing to pay a premium for products sourced from certified forests (UNECE/FAO, 2010).

Although FSC Principle # 5 emphasizes the economic viability of forest management, relatively little attention is paid to the factors that affect the economic feasibility of certified forestry. Our analysis of Río Cangrejal revealed that forestry plays a complicated role in the local livelihoods. Almost every household had at least one person working in forestry in the certified forest communities, and the share of forest incomes in the household income portfolio frequently exceeded that of agriculture (Nygren & Myatt-Hirvonen, 2009). Forestry incomes also compared favourably to the earnings in alternative labour markets. According to our analysis, in terms of gross income, an average logger could earn 6.6 times the daily wage of an agricultural worker and 2.8 times that of a construction worker. However, despite being a lucrative activity, people's engagement in forestry was sporadic. Poor infrastructure, high transportation costs, and competition with illegal loggers made it difficult for the forestry groups to gain a profitable market niche, even when producing certified timber.

The forestry groups' incomes were also constrained by the hierarchical patterns of timber trade. Owing to the lack of collateral, the groups depended on informal credit

bargains, whereby urban timber dealers advanced them money on the condition that the timber would be delivered to the dealer who financed the operation. Such personalized debt-credit relations easily placed the forestry groups in a dependent relationship with the buyers, with limited opportunities to negotiate the terms of trade. According to our socio-economic study, the unequal relations between producers, intermediaries and processors largely remained in place even in certified wood production.

Another constraint was the high costs of certification, which in Río Cangrejal had reached USD 12,000 on average in various re-certifications. As the forestry groups could not afford to cover such costs by themselves, the costs had been largely subsidized by international donors. This can make forest communities highly dependent on donors. Even though FSC's group certifications and SLIMF initiatives demonstrate that significant efforts exist within FSC to reduce the certification costs faced by small Southern operators, there is an urgent need to find new ways to improve the economic viability of certified community forestry operations.

In recent years, several development projects have worked hard to help the community forestry operators in Río Cangrejal, as elsewhere in the tropics, to enhance the quality of their products and to improve the markets for certified products. Nevertheless, the enhancement of community forest producers' access to certified markets faces several challenges. First, the domestic markets for certified products are limited in many developing countries (UNECE/FAO, 2010). Second, most of the community forestry operators are unlikely to be competitive in conventional global wood markets, which require large volumes, cheap supply, and high product consistency. These markets are also increasingly linked to low-cost wood supply from forest plantations and illegal logging. Because of the limited demand from end-consumers, the majority of the conventional wood products are marketed without any reference to certification (Ebeling & Yasué, 2009).

At the same time, public advocacy has increased the sensitivity of global wood and furniture companies to ENGO pressure for environmental and social responsibility. It is here in environmentally and socially sensitive markets that certified community forestry groups may have a potential for improving their market access (Morris & Dunne, 2004). Our socio-economic analysis revealed that certain international companies, seeking to establish their reputation as environmentally and socially responsible suppliers, are recognizing the need to build partnerships with community forest producers. This especially concerns the segments of woodcrafts, small furniture, and home improvement products, where the global demand is diversifying into high-quality hardwoods, and thus brands from tropical forests and community forest producers may be preferred. An additional advantage may be that community forest operators are often able to harvest timber in small and inaccessible areas where the difficulty of the terrain and the low density of valuable timber species makes logging too costly for industrial operators.

Nevertheless, community forest operators often have difficulties in meeting the standards of quality, reliability, and product styling that certified markets require. Currently, relevant eco-sensitive markets exist in Western Europe; elsewhere, the supply of certified products exceeds the market demand (Ebeling & Yasué, 2009). In Río Cangrejal, the certified forestry groups are producing small volumes of kitchenware and furniture for Danish niche markets through contacts with particular retailers. However, because the timber is sawn into cants with chain saws and much of the timber suffers from fungal infestation due to open air drying, it is difficult to meet the quality required. In Honduras, the main buyers of certified timber are some furniture processors who sell their products to US markets. These buyers, however, focus on a few high-quality hardwoods and they do not pay a price premium for certified timber. Until efficient regional processing and marketing structures are created, few of the community forest operators seem to have the financial and managerial resources to

generate the quality of products demanded by global markets for certified products.

Despite these factors, FSC Principle #5 focuses on the local-level processes of forest management, with limited consideration of the wider political economy, such as eco-sensitive markets or institutional structures that shape the opportunities of community forest producers to benefit from certified forestry. No requirements for environmental and social responsibility are set for traders dealing with products sourced from forests with a forest management certificate, nor are such traders' operations audited by FSC. This raises concerns over the opportunities of the FSC to challenge the existing power relations in the global forest markets and to promote fairer trade in forest products (Klooster, 2006; Taylor, 2005b). In this respect, FSC certification differs significantly from FLO certification for agricultural products, where the companies trading Fair Trade products must pay the Fair Trade minimum price and the premium for social development for the producers, and sign contracts that allow for long-term planning and production practices (FLO, 2010a).

Sustained yield of forest products

The long-term economic viability of forest management also requires the guaranteeing of sustainable timber resources. Because of the lack of financial resources, compensatory planting of timber tree species is not carried out in a systematic way in Río Cangrejal. The maintenance of a sustained yield thus relies on natural regeneration, which is enhanced by reduced-impact logging (RIL) techniques, including the designation of seed trees, planning of transport routes, practicing of directional felling and cutting of lianas before felling to minimize the damage to surrounding trees. The fulfilment of the requirements related to RIL, implicitly included in the FSC criteria, has not demanded major changes in the forest management system in Río Cangrejal. No heavy machinery is used in the logging operations,

and the construction of forest roads is rare. According to the Honduran forest regulation, all forest operations, whether certified or not, need to have a management plan.

The underlying idea in the certifiers' recommendations to limit the logging to certain areas is to guarantee sufficient seed dispersal, while mechanical logging damage is reduced to protect the juvenile timber trees. These activities may be effective in guaranteeing the regeneration of the logged species, if the forest structure and species composition are in a natural state. However, such conditions may not exist in Río Cangrejal. According to our analysis, the regeneration of timber species in logging gaps was significantly lower in certified forests than in conventionally managed ones, even though the environmental conditions indicated reduced logging damage in the certified forests. This may indicate that past uncontrolled loggings have reduced the populations of timber species more in the certified forests. This assumption was supported by the finding that the only timber species with a higher regeneration rate in the certified forests were light-demanding species, which typically benefit from improved light availability caused by logging. Felled timber trees were also smaller in diameter in certified forests compared to conventionally managed forests and protected forests, indicating that the relative abundance of trees below the commercial size had increased (Kukkonen, Rita, Hohnwald & Nygren, 2008).

Another factor that may limit the regeneration of timber species in Río Cangrejal is forest fragmentation, i.e. the splitting of a continuous forest area into isolated fragments. When the abundance of commercially valuable trees is reduced as a result of logging, the recovery of the harvested species is largely dependent on the connectivity with surrounding forests (Chazdon, 2003). Such connectivity may be limited in Río Cangrejal, where the lowlands have largely been converted to agriculture and pasture, and the remaining forests on the hillsides are fragmented. We found typical secondary forest and fallow species in high numbers in the logging gaps of the certified forests, which suggests that these species may be

replacing primary forest tree species (Kukkonen & Hohnwald, 2009). Fragmentation may also affect regeneration through the limited habitat connectivity of animals that act as pollinators and seed-dispersal agents. Invertebrate pollinators typically have limited movement across agropastoral areas, and many of the dominant seed-dispersing animals, such as birds, bats and primates, are sensitive to forest fragmentation (Cordeiro & Howe, 2001). Despite these facts, limited attention has been paid to forest fragmentation in the FSC criteria on forest regeneration.

In addition, timber tree regeneration may be limited by the distribution of suitable sites for seed germination and tree growth. In Río Cangrejal, valuable timber species include light-demanding species, such as *Terminalia amazonia* and *Cordia alliodora*, as well as shade-tolerants, such as *Virola koschnyi* and *Guarea grandifolia*. The FSC criteria place considerable emphasis on minimizing the mechanical impacts of logging and creating small, single-treefall gaps, which may in the long term improve the regeneration of those timber species that do well in shaded conditions, while constraining the regeneration of the light-demanders.

The current demand for Río Cangrejal timber is focused on the few most valuable timber species, whereas the most frequent, non-traditional timber species are rarely logged to the limit of the allowable cut. Although the development projects operating in Río Cangrejal have worked hard to find markets for non-traditional timber species, many of them are difficult to sell to international buyers who are often only familiar with the most popular tropical hardwoods. In 2003, the species with highest volumes extracted in Río Cangrejal was *Magnolia yoroconte* (AFE-COHDEFOR, 2004). In our study, the regeneration of *M. yoroconte* was found to be poor, indicating unsustainable harvesting rates of this light-demanding timber species.

FSC Principle #5 also encourages the efficient use of non-timber forest products

(NTFPs). On this basis, the certified forestry groups of Río Cangrejal are expected to incorporate a range of NTFPs into their management plans. The economic viability of NTFP extraction in tropical forest ecosystems with a relatively low abundance of commercially valuable species per hectare is, however, a demanding task (Sunderlin et al., 2005). Since the 1990s, a group of Río Cangrejal women have been trying to develop a small business based on orchids extracted from the certified forests, but with limited market success.

ENVIRONMENTAL IMPACTS

FSC Principle #6 lists conditions that environmentally sound forest management should secure. The focus is on the maintenance of forest integrity, i.e. natural forest species composition, structure, dynamics and functions. Compared to intensive mechanical harvesting, the environmental impact of the harvesting system employed in Río Cangrejal is low. Manual harvesting and the use of mules and human labour in transportation cause relatively little damage to residual forest stands. Harvest intensities are low, varying between 2.2 and 6.5 trees per ha in the logged segments (AFE-COHDEFOR, 2004).

Nevertheless, our ecological study established that the similarity in species composition between the logging gaps of certified and protected forests was lower than between the logging gaps of conventionally managed forests and protected forests. This may be partly because pre-certification loggings have changed the species composition in certified forests more than in conventionally managed forests. Our study also indicated that some fallow species were replacing forest species in the logging gaps of certified forests (Kukkonen & Hohnwald, 2009). These findings suggest that actions to improve the connectivity between forests and restore the degraded species may be of more importance to the ecological integrity than the reduction of mechanical logging damage.

FSC Principle #6 also requires the establishment of conservation areas and preservation of the habitats of rare and threatened species. In each of the certified forests of Río Cangrejal, about 10% of the forest area is reserved for protection. In the evaluations of species conservation, the certifiers have used the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) appendices as a baseline (SmartWood, 1998; 2003). However, due to their biases towards the species that are in demand in international trade, the best-known taxonomic groups and largest organisms, such lists may form a problematic basis for species conservation (Possingham et al., 2002).

MANAGEMENT PLAN

FSC Principle #7 sets the requirement for elaborating a management plan that integrates socio-economic and environmental information on the local conditions. Although certain rules for management planning are included in Honduran forest legislation, the FSC requirement for management plans has led to better-defined management standards in the community forestry operations of Río Cangrejal (Field data, 2004–2005; Markopoulos, 2003).

Pre-logging inventories are conducted in certified forest operations in Río Cangrejal to define the allowable cut and the minimum diameter of the trees to be harvested. The problem in such inventories is that they fail to take into account that the regeneration ability of timber species may have been affected by past loggings. Furthermore, a 30-year cutting cycle has been implemented in the certified operations. However, recent studies indicate that such a cycle may be too short to guarantee the successful regeneration of many of the neotropical timber species, especially when systematic post-harvest silvicultural treatments, such as the planting of seedlings of the logged tree species and removal of

competing vegetation, are not employed (Schulze, Grogan & Vidal, 2008).

MONITORING AND ASSESSMENT

FSC Principle #8 emphasizes the need for monitoring the environmental and the socio-economic impacts of forest management. Although it allows less rigorous monitoring in low-impact community forest operations, it also underlines the need for careful monitoring in potentially fragile ecosystems, such as the tropical moist forests in Río Cangrejal.

Due to spatiotemporal differences in the patterns of seed dispersal and seedling establishment, the monitoring of post-logging regeneration is complicated when a variety of timber tree species are logged. Furthermore, tropical tree species often have clumped distributions, which means that recording their regeneration would require larger areas than the 10-20 ha fragments logged in Río Cangrejal. Principle #8 also demands that the impacts of logging on local flora and fauna are assessed. However, the lack of indicator groups that reliably represent changes in the forest ecosystems make such assessments difficult to conduct in the tropics (Lawton et al., 1998).

Monitoring the socio-economic impacts of forestry is an equally complicated task. The economic costs of forest management are difficult to assess because of the high informal transaction costs. Interestingly, it is here that the term ‘chain of custody’ is mentioned for the first time in the FSC principles. According to Principle #8, “documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as the chain of custody” (FSC, 2002, p. 8). However, in the case of a certificate of good forest management, such as that of Río Cangrejal, this requirement only demands that the forest managers provide information on where the wood comes from within their forest operations. No documentation is required on

the products' itinerary along the value chain, once they are treated by processors, traders, or other actors, until end consumption.

On the other hand, the FSC requirement for monitoring the socio-economic impacts of forest management has provided important tools for Río Cangrejal community forestry groups to improve their administrative procedures. Such monitoring has also facilitated the governmental approval of the groups' management contracts, and simplified the state auditing of their forest operations. At best, careful monitoring can serve as documented evidence of the forestry groups' environmentally and socially responsible forest management. According to certification evaluations carried out in Honduras, illegal forest clearing has decreased in those regions with certified community forest management (SmartWood, 2003). This issue was confirmed by the Río Cangrejal forestry groups, according to whom the forests of Río Cangrejal would already have been cleared for cattle raising if the groups had not practiced certified forestry in them.

The FSC multiple-stakeholder consultations related to the national certification standards have also increased the participation of Río Cangrejal community forestry groups in policy-making. According to our interview and participant-observation data, the improved monitoring capacities have promoted several spin-off effects, whereby the certified Río Cangrejal forestry groups have begun to pressure state authorities to eliminate corruption and improve the control over the illegal timber trade. At the same time, the forestry groups have gained important indirect benefits, such as increased self-esteem, social prestige, and political bargaining power in different arenas of forest governance.

MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS

FSC Principle #9 deals with the maintenance of high conservation value forests. In temperate

regions, indicators of old-growth forests are commonly used to distinguish areas of high conservation value. In selectively logged tropical forests, clear indicators of high conservation value forest are, however, difficult to establish. In Río Cangrejal, the areas assigned by the certifiers as having a high conservation value include forest areas bordering streams and rivers, and forest tracts surrounding the protected areas (SmartWood, 1998).

In Honduras, as in many other developing countries, rural poverty and high conservation value forests tend to share an overlapping space (Sunderlin et al., 2005). The rugged terrain and vulnerability to soil erosion make these lands ecologically best suited for forest activities. Simultaneously, difficult access and poor infrastructure limit the economic benefits derived from forestry. New initiatives would be needed to make forest certification more affordable for community forestry groups that manage the high conservation value forests, whose size and inaccessibility do not allow the generation of a substantial income from forestry.

Interlinkages between Environmental and Socio-Economic Factors

According to our analysis, several environmental and socio-economic factors affect the ability of tropical community forestry operators to fully benefit from FSC certification (Table 3). In the following, we discuss four issues where the links between environmental and socio-economic factors are highly relevant, and which would need more attention from the perspective of community forestry: 1) the heterogeneity in local forest ecosystems and communities, 2) complex land-use histories, 3) forestry as part of the eco-social landscape, and 4) the links between certified forestry and the wider political economy of timber trade.

THE HETEROGENEITY OF FOREST ECOSYSTEMS AND COMMUNITIES

589

590 The logging of a range of tree species with differing ecologies sets special demands for the
 591 planning of forest management. The minimization of environmental damage, although
 592 essential for the maintenance of natural forest composition and functions, may favour the
 593 shade-tolerant timber species over the light-demanding ones. On the other hand, attempts to
 594 improve the regeneration of the light-demanding species may lead to intensified competition
 595 from secondary species; in our ecological study, we found agropastoral species to colonize
 596 many logging gaps of the certified forests in Río Cangrejal.

597 Another issue related to the environmental impacts of certified forest management
 598 is that because the main threats to the maintenance of forest integrity in many community
 599 forests are more likely to be related to forest fragmentation than to the current low-impact
 600 loggings, shifting the attention towards landscape-level connectivity and structural
 601 heterogeneity could provide a more appropriate approach to environmental conservation in
 602 such areas (Lindenmayer, Franklin & Fischer, 2006).

603 The same issue concerns the social heterogeneity of forest-based communities. The
 604 livelihood strategies in many tropical forest communities, including those of Río Cangrejal,
 605 depend on an array of activities and income sources, such as agriculture, forestry, cattle
 606 husbandry, casual wage work, informal trading, and migration work (Nygren & Myatt-
 607 Hirvonen, 2009; Sunderlin et al., 2005). Within this plurality of livelihood strategies,
 608 community forestry often plays an important, although sporadic role. The limited attention in
 609 the FSC principles to the existing socio-economic heterogeneity may lead to an inaccurate
 610 assumption that all the community members are participating in certified forestry and sharing
 611 the benefits and risks involved.

612 Any approach to certified community forestry should also recognize the social
 613 differentiation and institutional complexity within which the productive resources are used,

managed and controlled. Well-targeted principles for certified community forestry would require increased attention towards different resource users and resource interests. A framework that carefully considers the role of forestry within an array of livelihood strategies and land-use practices could provide a more appropriate approach for economically and socially sustainable forestry in tropical developing countries.

THE HISTORY OF FOREST USE

Our findings from Río Cangrejal indicate that selective logging in previous decades may have negatively affected the populations of many timber species. A similar situation may be found in many tropical community forests, because of intensive periods of selective logging and illegal forest exploitation at times when local resource rights were poorly legitimated (Taylor, 2005b). The forest certification principles should focus more attention on the constraints set by past uncontrolled loggings on environmental soundness and economic feasibility in certified community forestry operations.

On the other hand, many tropical forest communities have a long history of low-intensity forest management, including small-scale timber and NTFP extraction. These traditional forest-use practices have often been scarcely utilized in the planning of certified forest management. As Leach & Fairhead (2000) note, small-scale forest management by local inhabitants has influenced forest biodiversity in many parts of the tropics for decades. Better incorporation of traditional environmental knowledge in the FSC forest management planning criteria would be highly recommended.

FOREST ACTIVITIES AS PART OF THE ECO-SOCIAL LANDSCAPE

The scope of FSC certification is the forest management unit level; consequently, SmartWood audits have largely concentrated on the direct physical impacts of logging. However, the maintenance of forest integrity in fragmented community-forest landscapes would require actions that focus beyond the management unit level. In particular, these include improving the quality of agropastoral areas as migration pathways for forest organisms and the connectivity of the managed forests to protected forests. Recent discussions on tropical forest landscapes suggest integrated land-use management such as agroforestry systems, where high-value timber trees are grown on agropastoral lands (Harvey et al., 2008), the protection of gallery forests along farmland waterways (Tabarelli & Gascon, 2005), or the planting of animal-dispersed forest trees on abandoned pasturelands (Martínez-Garza & Howe, 2003). However, with the existing insecurity of resource rights in many tropical forest communities, the willingness of smallholders to plant trees on agropastoral lands where their resource rights are unstable cannot be guaranteed.

While the debate on the role of managed forests in biodiversity conservation continues, various scholars have suggested that well-managed forests could potentially enhance the conservation value of the adjacent protected forests (Azevedo-Ramos et al., 2006; Putz, Blate, Redford, Fimberl & Robinson, 2001). In Río Cangrejal, the protected forests of Pico Bonito act as important refuges for plant and animal species unique to this region (House, Cerrato & Vreugdenhil, 2002). Efforts to design a network of certified forests around the protected areas could have a significant role in the conservation of biodiversity.

Concerning the socio-economic landscapes, although the careful documentation of local resource rights is laudably recognized in the FSC principles, it would be important that the FSC criteria explicitly state the need for governmental authorities to ensure more secure resource rights for community forestry groups. A broader access approach that recognizes the plurality of formal and customary resource rights could provide a more appropriate

framework to acknowledge the socio-legal and cultural heterogeneity in tropical forest communities.

Similarly, it would be important to better consider the role of FSC as a voluntary form of forest governance within the wider socio-political perspective. Through the spread of certification as a market-based mechanism of forest governance, the role of state institutions in forest regulation has been reduced (Taylor, 2005b). This has encouraged the Honduran forest authorities to increasingly push the control of illegal logging onto the shoulders of certified forestry groups, with limited institutional support. Since law enforcement is largely the responsibility of state authorities, it would be highly recommendable to make it more explicit in the FSC criteria whose responsibility it is to control illegal logging and what are the roles and responsibilities of different stakeholders involved in forest governance.

LINKS TO THE WIDER POLITICAL ECONOMY

Improving the socio-economic viability of certified community forestry would require better consideration of the wider political-economic conditions that shape the income opportunities of certified community forestry groups. Our analysis indicated that certification has not considerably changed the power relations that shape the community forestry producers' access to markets. By focusing on community-level conditions, the FSC principles pay limited attention to the wider dynamics of certified timber trade and the power relations involved.

It would be important to formulate the FSC principles in a way that they better capture the benefits and constraints faced by Southern community forestry operators in the certified forest markets. Community forestry operators with little experience of global markets, and with scarce resources to significantly intensify their production, have limited

opportunities to guarantee the volume, quality and timely delivery that global timber and furniture buyers demand (Klooster, 2006). More focus would be needed in the FSC principles on the certifications of chain of custody in relation to community forestry. Such certifications could promote new partnerships between certified community forestry groups and the timber and furniture companies that are interested in improving their reputation as environmentally and socially responsible suppliers of tropical forest products. These partnerships could also help to distribute the costs of certification more evenly, and to enhance the opportunities for certified community forestry operators to compete with those practising illegal timber trade.

Conclusions and Policy Implications

Our analysis of the FSC certification principles in relation to tropical community forest management demonstrated that certification has provided several benefits for the studied community forestry groups of Río Cangrejal. These benefits include increased recognition of the customary resource rights, growing awareness among the local people of the value of their forests, and improved control over unauthorized forest clearing and illegal logging. Certification has also enhanced the forestry groups' participation in forest policies, facilitated governmental approval of the management contracts, and served as documented evidence of the forestry groups' environmentally and socially responsible forest management.

At the same time, several factors limit the ability of certification to benefit the local operators and improve the environmental sustainability of community forestry. The eco-social landscapes in tropical developing countries are shaped by complex land-use histories, multifaceted resource rights, and heterogeneous forest users with differentiated interests toward forest resources. The high costs of certification and the financial dependency on donors also constrain the opportunities of community forestry operators. Poor knowledge of

tropical ecosystems and the different ecological requirements of the logged timber tree species pose additional challenges. These factors are insufficiently recognized in the FSC certification principles.

It would also be important to consider that many of the processes critical to sustainable forestry reach beyond the current scope of FSC. From the ecological perspective, actions taken at the level of the forest management unit may be insufficient to maintain forest integrity and sustain timber tree populations in ecosystems affected by forest fragmentation and degradation. Instead of concentrating the attention to the reduction of mechanical logging damage, the quality of the agricultural areas between forests as pathways for seed-dispersing animals would need attention in the low-impact community forest management systems. From the socio-economic point of view, FSC's focus on local-level forest management treats the forest communities as somewhat isolated from the wider political-economic context. Increased attention should be focused on improving the position of certified community forest operators in the global forest markets.

In this respect, FSC should further pursue several critical reforms. First, instead of the current formalistic approaches that require the careful documentation of customary resource rights along with formal standards of legality, FSC could pursue more creative and context-sensitive approaches to customary resource rights concerning tropical community forests. At the same time, FSC should strive for better governmental recognition of the communities' traditional resource rights (Ribot & Peluso, 2003; Tollefson et al., 2008).

Second, increased attention should be paid to the broader context of legality and legitimacy. Because of the complexity of laws and their instability over time, Southern smallholders are sometimes forced into criminalized forest activities. Besides, the drivers behind illegal timber trade are largely global. Concerning the monitoring of illegal timber trade, it might not be fair to expect certified community forestry groups to control illegal

forest activities in the areas under their operation. Instead, strategies that better combine the voluntary, market-based instruments of forest governance with the mechanisms of efficient law enforcement and legally-binding forest regulation could be worth consideration (Cashore, Auld & Newsom, 2004; Howlett et al., 2009).

Third, the new initiatives for a joint labelling project by FSC and FLO, whereby those forest sources that are already FSC certified could be labelled by Fair Trade Standards for timber (FLO, 2010b), would significantly widen FSC's current focus on the conditions of forest management. Regarding Fair Trade's commitment to modifying the conventional global value chains by promoting alternative trade relations between Northern consumers and Southern producers, FSC might improve its credibility as a socially responsible trade network. However, the fact that the payment of minimum prices could not be guaranteed for certified forest products, even within this joint FLO/Fairtrade standard, raises certain doubts over the innovativeness of this project. According to the current plans, given the variety of forest products, it would be impossible to set minimum prices for certified forest products similarly to those that apply for many Fair Trade agricultural products, such as coffee or banana. A single premium percentage for social development would be equally difficult to set, since the value of the forest products is added at diverse levels of processing and thus makes the value chains of forest products more complex than those of tropical agricultural products (FLO, 2010b; Taylor, 2005 b).

Fourth, as market-based mechanisms of environmental governance, certifications alone may be unable to create long-term alternatives to environmentally sustainable and socially responsible development in the global South. In fact, many of the problems faced by FSC are common to most of the certification schemes seeking to certify Southern small producers. Fair Trade certified coffee, for example, represents about 1% of global coffee production, and the supply highly exceeds the demand (Valkila & Nygren, 2010). Viable

strategies for diminishing the vulnerabilities of Southern small producers in maintaining their livelihoods through engagement in rapidly changing global niche markets would be worth careful consideration in all certification systems operating in the tropics (Auld, 2010).

Finally, general principles and criteria are crucial for accountable certification systems. The risk in such generic principles is, however, that they easily conceal the many different ‘realities’ that constitute the global networks of production and consumption, and thus may lead to unintended negative consequences (Goodman, 2008; Pattberg, 2005). Deeper understanding of diverse local circumstances and their complex linkages to wider political-economic conditions is needed to develop strategies that carefully combine the goals of responsible forest management, sustainable livelihoods, and socially fair and economically viable trading networks.

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Table Captions

907
908

909 Table 1. Description of the studied forest communities and forest areas.

910

911 Table 2. The FSC principles applied in certified community forest management (Source:
912 FSC, 2002).

913

914 Table 3. The main socio-economic and environmental factors affecting the feasibility of the
915 FSC certification principles in relation to community forest management in Río Cangrejal.

916 **Table 1.**

Name of community/ forest area	Number of households	Forest type	Size of production forest (ha)	Altitude (m, above sea level)	Name of forestry group	Number of members (2004)
Río Viejo	79	Certified	618	930	Peralta y asociados	14
Toncontín	133		1061	900	Reyes y Asociados	28
Yaruca	104		625	650	Tinoco y Asociados	12
El Naranjo	61	Conventionally managed	1682	250	Marciano Lobo y Asociados	13
El Pital	40		N/A	500	N/A	N/A
El Urraco	53		1709	950	Castellano y Asociados	16
Las Mangas	-	Protected	-	850	-	-
La Primavera	-		-	200	-	-
Pico Bonito	-		-	200	-	-

917

918

Table 2.

Principle	Main requirements
#1: Compliance with laws and FSC Principles	· Forest management shall respect all national and local laws, relevant international treaties and agreements, and comply with all FSC principles and criteria.
#2: Tenure and use rights and responsibilities	· Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established
#3: Indigenous people's rights	· The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognized and respected.
#4: Community relations and workers' rights	· Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.
#5: Benefits from the forest	· Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.
#6: Environmental impacts	· Forest management shall conserve biological diversity and its associational values, water resources, soils, and unique and fragile ecosystems and landscapes, and by so doing maintain the ecological functions and the integrity of the forest.
#7: Management plan	· A management plan – appropriate to the scale and intensity of the operations – shall be prepared, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.
#8: Monitoring and assessment	· Monitoring shall be conducted – appropriate to the scale and intensity of forest management – to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.
#9: Maintenance of high conservation value forests	· Management activities in high conservation value forests shall maintain or enhance the attributes that define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

923 **Table 3.**
924

	Socio-economic factors	Environmental factors
#1: Compliance with laws and FSC Principles	<ul style="list-style-type: none"> - Forest laws and regulations are complex and contradictory - Prevention of illegal logging involves high risks 	<ul style="list-style-type: none"> - Governmental quotas restrict appropriate use of the silvicultural potential
#2: Tenure and use rights and responsibilities	<ul style="list-style-type: none"> - Customary rights and local resource use practices may be difficult to legitimate 	<ul style="list-style-type: none"> - Insecure resource rights make it difficult for smallholders to commit themselves to coordinated efforts for improving the forest connectivity
#3: Indigenous people's rights	N/A	
#4: Community relations and workers' rights	<ul style="list-style-type: none"> - Community members have varying levels of involvement in forestry - Low profits from forestry do not enable investment in workers' health and insurance. 	<ul style="list-style-type: none"> - Manual logging on hillsides is a physically demanding task, which limits engagement in forestry
#5: Benefits from the forest	<ul style="list-style-type: none"> - Lack of price premium for certified products reduces profitability - Diverse income sources limit the ability to focus on certified forestry - Scarce resources for long-term business strategies constrains market access - High costs of certification increase dependency on external donors - Hierarchical patterns have not been changed in certified timber trade. - Community producers have poor bargaining power in certified forest value chains 	<ul style="list-style-type: none"> - Past loggings have reduced the populations of timber tree species - Forest fragmentation limits the post-logging recovery of forests - RIL may constrain the regeneration of light-demanding timber tree species - Logging pressure is highest for the most degraded timber species - Low abundance of valuable NTFPs limits profitability - Lack of resources for compensatory planting limits timber tree regeneration
#6: Environmental impacts		<ul style="list-style-type: none"> - Assessment of environmental impacts is highly demanding in tropical forest ecosystems - Pre-certification loggings and forest fragmentation may affect biodiversity more than current loggings - Forest conservation is based on CITES lists instead of area-specific information
#7: Management plan	<ul style="list-style-type: none"> - Limited attention to the socio-economic conditions of forest management 	<ul style="list-style-type: none"> - Past logging has an impact on the current populations of timber tree species - A 30-year rotation period is too short for the productivity of many timber species
#8: Monitoring and assessment	<ul style="list-style-type: none"> - Lack of resources to implement careful monitoring - Control of illegal logging increasingly laid on the shoulders of local forestry groups 	<ul style="list-style-type: none"> - Spatio-temporal variability in the regeneration patterns of timber species makes monitoring difficult - Lack of well-known indicator groups to monitor changes in flora and fauna
#9: Maintenance of high conservation value forests	<ul style="list-style-type: none"> - Limited attention to links between forest conservation and local livelihoods 	<ul style="list-style-type: none"> - Lack of indicators for defining high conservation value forests